

**FORSPAN ASSESSMENT MODEL FOR CONTINUOUS
ACCUMULATIONS--BASIC INPUT DATA FORM (NOGA, Version 9, 2-10-03)**

IDENTIFICATION INFORMATION

Assessment Geologist:	M.A. Kirschbaum	Date:	9/20/2005
Region:	North America	Number:	5
Province:	Wind River Basin	Number:	5035
Total Petroleum System:	Cretaceous-Lower Tertiary Composite	Number:	503502
Assessment Unit:	Frontier-Muddy Continuous Gas	Number:	50350261
Based on Data as of:	IHS Energy (2002, production data 2005), Wyoming Geological Association (1989), Wyoming Oil and Gas Conservation Commission (2005)		
Notes from Assessor:	SW Wyoming Province assessment unit Mowry Continuous Gas (50370261) used as partial analog.		

CHARACTERISTICS OF ASSESSMENT UNIT

Assessment-unit type: Oil (<20,000 cfg/bo) or Gas (≥20,000 cfg/bo), incl. disc. & pot. additions Gas

What is the minimum total recovery per cell? 0.02 (mmbo for oil A.U.; bcfg for gas A.U.)

Number of tested cells: 51

Number of tested cells with total recovery per cell ≥ minimum: 21

Established (discovered cells): X Hypothetical (no cells):

Median total recovery per cell (for cells ≥ min.): (mmbo for oil A.U.; bcfg for gas A.U.)

1st 3rd discovered	<u>3</u>	2nd 3rd	<u>4</u>	3rd 3rd	<u>2.2</u>
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Assessment-Unit Probabilities:

<u>Attribute</u>	<u>Probability of occurrence (0-1.0)</u>
1. CHARGE: Adequate petroleum charge for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
2. ROCKS: Adequate reservoirs, traps, seals for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
3. TIMING: Favorable geologic timing for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):	<u>1.0</u>

NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES

1. Total assessment-unit area (acres): (uncertainty of a fixed value)

calculated mean	<u>1,750,000</u>	minimum	<u>1,575,000</u>	mode	<u>1,750,000</u>	maximum	<u>1,925,000</u>
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2. Area per cell of untested cells having potential for additions to reserves (acres): (values are inherently variable)

calculated mean	<u>153</u>	minimum	<u>40</u>	mode	<u>120</u>	maximum	<u>300</u>
uncertainty of mean:	minimum	<u>120</u>	maximum	<u>185</u>			

3. Percentage of total assessment-unit area that is untested (%): (uncertainty of a fixed value)

calculated mean	<u>99.6</u>	minimum	<u>99.5</u>	mode	<u>99.6</u>	maximum	<u>99.7</u>
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Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES
(Continued)

4. Percentage of untested assessment-unit area that has potential for additions to reserves (%):
(a necessary criterion is that total recovery per cell \geq minimum; uncertainty of a fixed value)

calculated mean 3.8 minimum 0.7 mode 1.6 maximum 9

Geologic evidence for estimates: Based on locations of faults, fractures, and existing sweet spots.
Minimum reflects infill around existing established production and recompletions of deep wells.
Maximum reflects areas of structure that should enhance permeability.

TOTAL RECOVERY PER CELL

Total recovery per cell for untested cells having potential for additions to reserves:
(values are inherently variable; mmbo for oil A.U.; bcfg for gas A.U.)

calculated mean 1.14 minimum 0.02 median 0.7 maximum 15

AVERAGE COPRODUCT RATIOS FOR UNTESTED CELLS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<u>Oil assessment unit:</u>	minimum	mode	maximum
Gas/oil ratio (cfg/bo)	<u> </u>	<u> </u>	<u> </u>
NGL/gas ratio (bngl/mmcf)	<u> </u>	<u> </u>	<u> </u>
<u>Gas assessment unit:</u>			
Liquids/gas ratio (bliq/mmcf)	<u>0</u>	<u>0.5</u>	<u>2</u>

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

SELECTED ANCILLARY DATA FOR UNTESTED CELLS

(values are inherently variable)

Oil assessment unit:	minimum	mode	maximum
API gravity of oil (degrees)	<hr/>	<hr/>	<hr/>
Sulfur content of oil (%)	<hr/>	<hr/>	<hr/>
Depth (m) of water (if applicable)	<hr/>	<hr/>	<hr/>

Drilling depth (m)

minimum	F75	mode	F25	maximum
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

Gas assessment unit:	minimum	mode	maximum
Inert-gas content (%)	<hr/> 0.00	<hr/> 0.50	<hr/> 2.00
CO ₂ content (%)	<hr/> 0.00	<hr/> 3.00	<hr/> 5.00
Hydrogen sulfide content (%)	<hr/> 0.00	<hr/> 0.00	<hr/> 0.00
Heating value (BTU)	<hr/> 950	<hr/> 1000	<hr/> 1100
Depth (m) of water (if applicable)	<hr/>	<hr/>	<hr/>

Drilling depth (m)

minimum	F75	mode	F25	maximum
<hr/> 2400	<hr/> 4614	<hr/> 6400	<hr/> 6234	<hr/> 7300

Success ratios:	calculated mean	minimum	mode	maximum
Future success ratio (%)	<hr/> 48.33	<hr/> 30	<hr/> 40	<hr/> 75

Historic success ratio, tested cells (%)

39

Completion practices:

1. Typical well-completion practices (conventional, open hole, open cavity, other)	<hr/> conventional
2. Fraction of wells drilled that are typically stimulated	<hr/> 1
3. Predominant type of stimulation (none, frac, acid, other)	<hr/> hydrofrac
4. Fraction of wells drilled that are horizontal	<hr/> 0

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES

Surface Allocations (uncertainty of a fixed value)

1.	<u>Wyoming</u>	represents	<u>100</u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u>100</u>	<u> </u>
2.	<u> </u>	represents	<u> </u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
3.	<u> </u>	represents	<u> </u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
4.	<u> </u>	represents	<u> </u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	represents	<u> </u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
6.	<u> </u>	represents	<u> </u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	<u> </u>	<u> </u>	<u> </u>

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

7.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
8.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
9.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
10.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
11.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
12.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS

Surface Allocations (uncertainty of a fixed value)

1. <u>Federal Lands</u>	represents	<u>45.57</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>38.5</u>	<u> </u>
2. <u>Private Lands</u>	represents	<u>33.77</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>25</u>	<u> </u>
3. <u>Tribal Lands</u>	represents	<u>12.63</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>19.5</u>	<u> </u>
4. <u>Other Lands</u>	represents	<u>1.58</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>0</u>	<u> </u>
5. <u>WY State Lands</u>	represents	<u>6.44</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>17</u>	<u> </u>
6. <u> </u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

7.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
8.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
9.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
10.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
11.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
12.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS

Surface Allocations (uncertainty of a fixed value)

1. <u>Bureau of Land Management (BLM)</u>	represents	<u>38.76</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u>34.5</u>	<u> </u>
2. <u>BLM Wilderness Areas (BLMW)</u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
3. <u>BLM Roadless Areas (BLMR)</u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
4. <u>National Park Service (NPS)</u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
5. <u>NPS Wilderness Areas (NPSW)</u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
6. <u>NPS Protected Withdrawals (NPSP)</u>	represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>			
Volume % in entity	<u> </u>	<u> </u>	<u> </u>

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

7. <u>US Forest Service (FS)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			
8. <u>USFS Wilderness Areas (FSW)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			
9. <u>USFS Roadless Areas (FSR)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			
10. <u>USFS Protected Withdrawals (FSP)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			
11. <u>US Fish and Wildlife Service (FWS)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			
12. <u>USFWS Wilderness Areas (FWSW)</u>	represents		area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity			
<u>Gas in gas assessment unit:</u>			
Volume % in entity			

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

13. <u>USFWS Protected Withdrawals (FWSP)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
14. <u>Wilderness Study Areas (WS)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
15. <u>Department of Energy (DOE)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
16. <u>Department of Defense (DOD)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
17. <u>Bureau of Reclamation (BOR)</u>	represents	6.81	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	4	_____
18. <u>Tennessee Valley Authority (TVA)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

19. Other Federal represents area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>

Gas in gas assessment unit:

Volume % in entity

20. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	<u> </u>	<u> </u>	<u> </u>

Gas in gas assessment unit:

Volume % in entity	_____	_____	_____
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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS

Surface Allocations (uncertainty of a fixed value)

1.	Central Basin and Hills (CNBH)	represents	100	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity		100	
2.		represents		area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity			
3.		represents		area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity			
4.		represents		area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity			
5.		represents		area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity			
6.		represents		area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity			
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity			

Assessment Unit (name, no.)
Frontier-Muddy Continuous Gas, 50350265

7.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
8.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
9.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
10.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
11.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
12.	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
